# NEW

# SYSTEM OF VENTILATION,

WHICH HAS BEEN

## THOROUGHLY TESTED,

UNDER THE PATRONAGE OF

## MANY DISTINGUISHED PERSONS,

BEING ADAPTED TO

PARLORS; DINING AND SLEEPING ROOMS; KITCHENS AND BASEMENTS; CELLARS, VAULTS AND WATER CLOSETS; TENEMENT HOUSES; SCHOOL, LECTURE AND COURT ROOMS; CHURCHES; LEGISLATIVE HALLS; POOR HOUSES, PRISONS AND HOSPITALS; FACTORIES AND DYE HOUSES; BREWERIES AND DISTILLERIES; POWDER MAGAZINES; STORES AND SHOW WINDOWS; BANKING HOUSES; HOTELS AND RESTAURANTS; FRUIT AND PROVISION CLOSETS; PORK PACKING HOUSES; STABLES; SHIPS AND STEAMBOATS; &c, &c. &c.

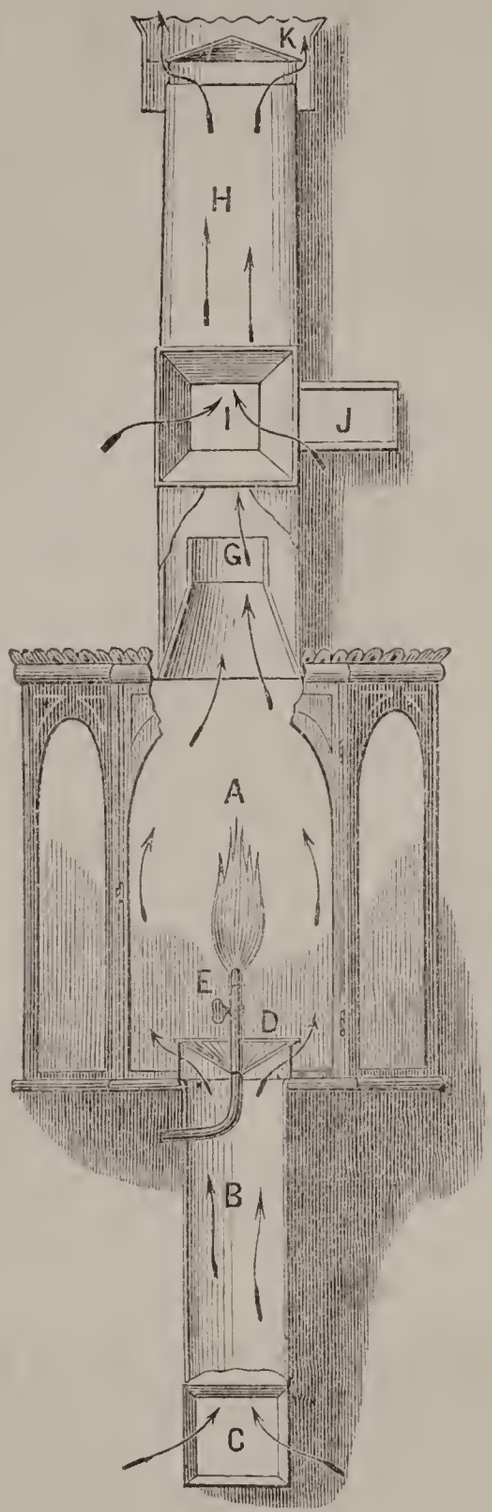
BY HENRY A. GOUGE.

"If we breathe a gas that is noxious, or air that contains but a very small proportion of carbonic acid, we die."—*Anatomy, Physiology and Hygiene.* BY PROF. JOHN C. DRAPER.

PAMPHLET EDITION.
PRINTED BY E. S. DODGE & CO., STEAM PRINTERS, 84 JOHN ST., NEW YORK.
1866.

# GOUGE'S ATMOSPHERIC VENTILATOR.

PATENTED MAY 26, 1863, APRIL 25, 1865, AND MAY 9, 1865.




☞ For DESCRIPTION OF CUT, see note, page 26.

☞ The arrows indicate the up-moving currents of air.

☞ The combustion of the gas jet at E is supported by the air which enters at C; and along with this air, which acquires a powerful ascensional force through the heat of the lantern, the heavy carbonic acid gas also ascends and mingles with the heated air and lighter noxious gases which enter the ventilator at I, all passing upward and onward, by virtue of an irresistible motive power, until they are finally discharged into the atmosphere.

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## REFERENCES.

The Patentee respectfully refers to the following gentlemen and business firms, who have used his apparatus, or given orders for the erection of it on their premises. See also Certificates at the end of this pamphlet.

Messrs. Hitchcock, Darling & Co., 5th Avenue Hotel, N. Y.
Albert Clark, Esq., Proprietor, Brevoort House, N. Y.
Paran Stevens, Esq., 244 Fifth Avenue, N. Y.
S. H. Gay, Esq., Editor of New York Tribune.
J. A. Hamilton, Esq., 46 Exchange Place, N. Y.
A. B. Darling, Esq., 40 West 23d Street, N. Y.
Samuel Sinclair, Esq., Publisher of New York Tribune.
Mrs. G. S. Robbins, No. 15 West Seventeenth Street, N. Y.
Jas. H. Banker, Esq., 98 5th Avenne, N. Y.
Hon. Judge Henry Hilton, 222 Madison Avenue, N. Y.
Daniel Devlin, City Chamberlain, N. Y.
Hon. Wm. Dennison, Postmaster-General, Washington City.
George Riggs, Esq., Banker, Washington City.
Messrs. Jay Cooke & Co., Bankers.
Hon. S. J. Bowen, Postmaster, Washington City.
Thos. McElrath, Esq., 8 Washington Place, N. Y.
Messrs. Breeden & Southwick, 109 Liberty street, N. Y.
John Taylor, Esq., International Hotel, N. Y.
S. D. Babcock, Esq., firm of Babcock Brothers, Bankers, N. Y.
Martin Bates, Esq., 51 Broadway, N. Y.
Charles A. Meigs, Esq., Banker, Exchange Place, N. Y.
Messrs. Middleton & Co., Shippers, N. Y.
R. W. Milbank, Esq., 82 Front Street, N. Y.
Lyman Fisk, Esq., Stevens' House, N. Y.
A. McKinney, Esq., 121 Beacon Street, Boston.
J. P. Richards, Esq., Belmont Hotel, N. Y.
Messrs. Symons & Havens, Market, Fulton Street, Brooklyn.
D. D. Winchester, Esq., Western Hotel, N. Y.
Messrs. Clark & Schenck, Merchant's Hotel, N. Y.
John W. Ritch, Esq., Architect, 153 Broadway, N. Y.
Messrs. William Field & Son, Architects, 54 Wall Street, N. Y.
Wm. B. Ditmars, Esq., Architect, 18 South 7th Street, Brooklyn.
Charles Cooper, Esq., Fulton Market, N. Y.
Messrs. Finck & Hencken, 191 Duane Street, N. Y.
Messrs. White & Ganes, 7 Worth Street, N. Y.

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# NEW SYSTEM OF VENTILATION, &c.

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This pamphlet is written for the purpose of giving a brief explanation of what is termed "*Gouge's Atmospheric Ventilator*," which we invented and patented some years ago. It has been extensively used since that time, having been put into practical operation in more than three hundred instances, and in every instance with complete and entire success. In view of this positive assertion, which, it is believed, will be sustained by the gentlemen who have honored the writer with their names as references, it may as well be stated that the patentee never asks to be paid for his services until he has fully accomplished the object for which he has been employed. In this way he hopes to win the confidence of those who apply to him for his professional services. Although the principle involved in the new system of ventilation, which will be hereafter explained, is simple and obvious, yet the successful application of it is sometimes very difficult, owing to conditions and circumstances which he will not attempt in this place to describe ; but with the varied experience which he has had for nearly four years, ventilating, as he has done, some of the most difficult places that can be imagined, he believes that no one applying to him for his services will ever be disappointed in his expectations.

### FOUL AIR—WHAT MAY BE DONE BY VENTILATION.

Foul or noxious air, in any of its forms, is eminently dangerous to health and life, as every physician who has thoroughly studied the subject will admit; but if we have the *bane*, we also have the *antidote*. The Atmospheric Ventilator, when properly adapted to the purposes required, will banish foul air and unwholesome odors and gases from every part of your domicil, workshop, store, office, building, or other unsavory or infected place, and furnish in their stead a full supply of fresh, pure, dry air, which will keep the blood in healthful circulation,

and aid in counteracting the many tendencies to disease. The air of your kitchen may be rendered as sweet as that upon the mountain top, instead of being permitted to permeate and contaminate the whole house, imparting a kitchen odor to your parlors, bedrooms, and even the dresses in your wardrobes.

Water closets may be deprived of their effluvia, and thereby truly rendered what is termed a "*modern improvement;*" cellars and basements may be rendered dry and sweet, so that you may go into them without the risk of contracting an asthma or a rheumatism; and your sleeping rooms may have the carbonic acid gas which is discharged from the lungs in breathing, with other poisons exhaled from the surface of the body, carried off as rapidly as they are formed, instead of being taken back again into the lungs; and in the place of these noxious agents, you will have pure air, in a steady, gentle, continuous volume, introduced into your rooms without exposing the occupants to draughts, as is the case when the windows are opened; and thus, upon rising in the morning, you will feel refreshed and invigorated, fully prepared for the duties or toils of the day, instead of suffering with that languor and debility which are so frequently experienced after sleeping all night in a close and poorly ventilated room. Ladies will have a finer *rouge* upon their cheeks than they can get from pink saucers, if they will only accustom themselves to sleep all night in a fresh and pure atmosphere.

### FOUL AIR AND DISEASE SYNONYMOUS—THE NEW YORK TRIBUNE.

The writer of this is not a physician, but in the course of his professional duties, ventilating kitchens, basements, water closets, offices, stables, and all sorts of places, he has seen enough to satisfy him that a great deal of disease results from bad air, without the cause oftentimes being even suspected. The people have yet to learn that pure air is one of the most essential requisites of a healthy existence. The influence of bad air has been constantly apparent to the writer. He recently visited a poor-house, in which there was no adequate ventilation, and the children were nearly all suffering with sore eyes, and other marks of disease. They were wretched looking objects. The directors feared the approach of cholera, and wished to have the place ventilated. When this is done, it will be found that much of the prevailing disease will disappear.

We ventilated a large banking-house in New York city, in which the air was extremely foul, and when the work was done, the clerks experienced an immediate change in the atmosphere; they felt refreshed and invigorated, instead of experiencing that sense of weariness and lassitude which accompanies a noxious air. One of the clerks, who had been for a long time asthmatic, immediately recovered his health.

A gentleman occupying a very handsome residence, had what he considered a damp and unwholesome parlor, for he scarcely ever came home from his counting-room and threw himself upon the sofa, without feeling as though he had taken a severe cold. Underneath the parlor was a damp sub-cellar, to which I attributed the difficulty, and upon establishing a proper ventilation, he ceased to take cold, and ceased also to be troubled with frequent attacks of rheumatic pains.

Let me add the authority of the Tribune in relation to the pernicious influence of bad air. My first introduction into the Tribune office was in consequence of a water closet which had given them a great deal of trouble, imparting a disgusting odor to the editorial rooms. It had been pulled down and newly erected three times, but still the nuisance was not abated. The proprietors of the establishment wished to avail themselves of my mode of ventilation, which was duly established, and which gave so much satisfaction that I was complimented with an editorial notice in the Tribune, from which I make the subjoined extract: "More deaths occur annually in New York which may be directly traced to bad ventilation, than are produced by all epidemical diseases combined. The atmosphere of many of the offices and counting-rooms is so poisonous that any one entering them from the fresh air is actually stifled, though unnoticed by the inmates, except by general lassitude, headaches, and incapacity for work. In our office we have introduced Mr. Gouge's system of ventilation with marked success. There may be as good, or even a better plan, but we have found this as effectual as anything can be in ill-contrived rooms. But what we desire to see is some plan adopted whereby the exhausted and impure air which is generated in the crowded shops, offices, schools, and factories of our city may be constantly displaced by the introduction of fresh and vital air."

Not only man but the domestic animals suffer from impure air. We have frequently noticed this in ventilating horse stables. The poor

animals, not having a full supply of pure air, gradually sicken, and begin to lose their sight. There is an immense amount of blindness among horses on this account. It does not seem to be understood that a horse needs fresh air quite as much as he needs hay or oats. We have seen splendid horses, which had cost the owners several thousand dollars apiece, sold at auction for a mere song, on account of blindness, induced by being shut up in close stables. This subject will be referred to again, under the head of "Stables"

### THE FOOD WE EAT—VENTILATED PROVISION CLOSETS.

This is a subject deserving more care and attention than it usually receives. We not only poison our blood with foul air, but frequently also by the use of improper food. The noxious gases which are so detrimental to the life forces, when taken into the lungs, will also, retained in refrigerators and provision closets, produce rapid putrefactive changes in the meat, fruits and other articles of food, which may be present. Food may be rendered unwholesome independently of a change which would be perceptible to the sense of smell. Carry off the noxious gases in question, however, as rapidly as they are formed, which is done in my *ventilated provision closets*, and it will be found that our most perishable fruits, of which strawberries are a very good type, will be preserved in a good condition for ten days, or longer, and fresh meat will keep sweet and good in the hot weather of summer for several weeks, retaining in the meantime its natural red color. Nothing will explain better than this, to the popular mind, the baneful effects of noxious airs and gases, not only in hastening destructive changes in our food, but in deteriorating or destroying our health. Hence it is that a cheap and efficient system of ventilation is one of the great needs of the age—one of the most urgent wants of our social system.

### NEW BOOK ON VENTILATION.

We have been employing our leisure time for a month or so in preparing a condensed book upon ventilation, deriving the subject matter from the highest and best authorities, and writing it in reference to our new process of ventilation, but being unable to finish it speedily, we have been obliged to prepare this little treatise for temporary use, as frequent applications have been made to us recently for such a publication.

## NOXIOUS GASES—HOW THEY ACT UPON AND DESTROY THE BLOOD—DR. MATTSON'S TESTIMONY.

In the new book, above referred to, we shall enumerate and describe the noxious gases which are introduced much too frequently into our breathing atmosphere, as *carbonic acid gas* from the lungs; *carbonic oxide* from imperfect combustion; and *carburetted* and *sulphuretted hydrogen* from the decomposition of animal and vegetable matter. The latter gas, so offensive to the smell, is an emanation also from water closets and drains. We quote from lectures entitled "Facts for the People Concerning Health," &c., by Dr. Morris Mattson, formerly of Boston, but now of New York city, in which good authority is given for the statement, familiar, no doubt, to every well-read physician, that sulphuretted hydrogen, and some other gases, will not only darken the blood, but actually decompose it, so that it cannot be restored by the oxygen of the air. We cannot conceive of any more cogent argument than this in favor of properly ventilating our houses, offices, workshops, factories, and all buildings in which human beings are crowded together. We cannot do better than to quote a few paragraphs from Dr. Mattson on this important subject. He says:

"*Carburetted* and *sulphuretted hydrogen*, along with *carbonic oxide*, are much to be dreaded when we take into account their peculiar action upon the blood. They produce their effects slowly, but with unerring results, unless the cause be removed. They darken the blood, as does carbonic acid, but unlike carbonic acid, they so change its character that it cannot be restored to a healthful condition by oxygen. This is an important consideration. Liebig says sulphuretted hydrogen turns the globules of the blood blackish green, and finally black, and the original red color cannot be restored by contact with oxygen, because a decomposition of them has obviously taken place. The globules darkened by carbonic acid, he adds, become again florid in oxygen, and also in nitrous oxide, which shows that they have undergone no decomposition. Here then is a difference between the two gases worthy of notice. Lehmann, the great German physiologist, who has the sanction of Professor Samuel Jackson, of the Pennsylvania University, (vid. Manual of Chemical Physiology,) tells us that 'carbonic oxide and several carbohydrogens' color the blood almost black, and destroy the blood globules, or in other words, that they 'combine so firmly with the

components of the blood globules, that the previous nature of the blood can in no way be restored.' "

"It will be seen, therefore, that the poisonous gases to which we are frequently exposed and obliged to inhale, excepting the carbonic acid, tend directly to decompose or destroy the blood, so that it can never be restored. This is a sufficient explanation of the virulent effects of the gases in question. 'In the blood is the life,' says the inspired volume, and whatever tends to disturb the healthful condition of that fluid must tend directly, and in an equal degree, to disturb the whole system. It need not seem extraordinary, then, that the gases aforesaid, acting suddenly and powerfully upon the system, should, as eminent medical authors allege, produce diarrhœa, dysentery, cholera, typhus, ship and gaol fevers, and even the pestilence. But we have these gases frequently in a more diluted form, pervading our kitchens, our parlors, and our sleeping rooms, and yet, perhaps, not appreciable to the sense of smell. Here, indeed, we have a secret foe, equally unseen and unheeded, which may sap the very foundation of life without our even suspecting the cause. Being the victims of bad drainage, &c., we are constantly inhaling those gases while confined within our houses, and they are as constantly decomposing or destroying the blood. This is especially true at night, while asleep, with perhaps every window carefully and tightly closed, so as to prevent the slightest possible access of pure, fresh air. We find ourselves a little pale at first upon rising in the morning, with an unpleasant lassitude, and perhaps some nausea or headache; but we go into the fresh air and these symptoms are dissipated. In truth, we do not regard them as very important. We renew the inhalations of the poisonous gases, day after day, and night after night, until the blood is essentially changed in its healthy composition, and with it the whole system is beginning to suffer in a marked degree, taking the form of dyspepsia, neuralgia, rheumatism, bilious trouble, heart difficulty, or some other phase of chronic disease. The countenance being pale and haggard, the doctor prescribes some form of iron, with the hope of improving the blood, but for some reason or other he finds he cannot produce a favorable change in that fluid. It does not seem to be understood that the blood is partially decomposed, and that the globules, which have suffered this destruction, can never be restored by any human agency; nor is *ventilation* thought of as a remedy, which, if efficient, would speedily banish every vestige of the

noxious gases which have caused all the difficulty, and which would prevent any further destruction of the blood globules—the first thing, indeed, to be thought of as a curative means. Thus, we are slowly and unconsciously poisoned—poisoned, perhaps, even unto death. We become the victims of a subtle agency of which our senses do not take cognizance; we yield to a cause of disease which is equally unseen and unheeded, but which is sure and terrible in its consequences."

### TO ARCHITECTS AND BUILDERS.

We respectfully solicit the judgment of architects and builders in relation to our method of ventilation. They are already fully informed as to the importance of the subject. At this particular time the community very naturally look to them for suggestions as to the best modes of guarding against disease, and especially the cholera, which may be slowly approaching our shores. No scientific architect need be told that to preserve health *it is imperative to have perfect ventilation.* But very few architects or builders have been able to devise any efficient plan for accomplishing this result. To effect the object, all impure or vitiated air must be quickly removed, and fresh air continuously introduced in its place. We claim, upon the score of an enlarged experience, as well as upon the basis of scientific and philosophic truth, that our *Atmospheric Ventilator* will accomplish this in the most perfect manner, and as no other method of ventilation ever yet discovered is capable of doing. It is simple in its construction; it is extremely economical; it costs nothing to keep it in order; it requires no skill in its use, and no attendance except the lighting of the gas jet; and it can be readily introduced into any apartment or enclosure requiring the interchange of a pure, fresh air, for one that is impure and unwholesome. Let architects and builders therefore stand between ourself and the public, and decide, according to their best jndgments, upon the merits of the invention in question. It should be borne in mind, also, that when buildings are in process of erection, the ventilating fixtures can be put in to better advantage and at much less expense than after the building has been completed.

### PARAN STEVENS, ESQ.—VENTILATION OF HIS STABLE, KITCHEN, AND REFRIGERATOR—MEAT-HOUSE IN THE FIFTH AVENUE HOTEL.

Mr. Stevens is a representative man, being the Napoleon of popular hotels in the United States. A. B. Darling, Esq., one of his partners

in the *Fifth Avenue Hotel*, is also a representative man, though not so extensively known to the public as Mr. Stevens. He arranged the general plan and construction of the hotel, and is its chief manager, purchasing all of the provisions and stores used in the establishment; in that capacity he applied to me for my services in ventilating his *meat house*. When the hotel was first commenced, he used large provision closets or refrigerators, without any opening or ventilation. These were soon abandoned because it was found that the meats speedily spoiled. He then packed his meats in large chests, alternating with layers of ice, which preserved the meats a longer time; but it was found that the portions of the meat in contact with the ice would be bleached perfectly white, and had to be cut off and thrown away. This, of course, was a great loss. Nevertheless, this plan was continued for many years, until I constructed for him a large ventilated meat house, capable of holding one or two tons of meat, which he has used ever since. With a temperature not exceeding forty-five or fifty degrees, he can keep meat in the hottest days of summer as long as he desires, which is usually a week or ten days; and during this time it retains its red color, which indicates that it is in the best and most wholesome condition for food. I am assured that not a pound of meat has been lost since the meat-house was put into operation. It is with some little professional pride and pleasure, therefore, that I would suggest to a generous public, not already familiar with the culinary and other attractions of the Fifth Avenue Hotel, that if they are desirous of regaling their palates with the best and choicest meats which the market affords, they need only record their names as guests at the above celebrated house. Indeed, it may be confidently stated that meats kept for a period of about ten days, (this is the theory of Mr. Darling,) in one of my ventilated meat houses or provision closets, whereby they have no opportunity of absorbing the injurious gases constantly present in close or imperfectly ventilated refrigerators, have a savory richness and delicacy, and withal a nutritive quality, not characteristic of meats kept in the ordinary way.

Succeeding so well in the experiment with the meat house, Mr. Darling employed me to ventilate all of his provision rooms, and also the large water-closet of the hotel, which had caused a great deal of trouble, and was a source of discomfort to the guests.

With this favorable introduction into the establishment, I was

requested to call upon Mr. Stevens, whose name is at the head of this article, and who had been complaining for a considerable time of the inadequate ventilation of his horse stable, perceiving, when he entered it, a stifling atmosphere and an almost intolerable odor, which was perceptible in his horses even when they were brought into the open air; and withal, his horses appeared to be in an unhealthy condition, with cold ears, bloodshot eyes, and other signs of disease. It was under these circumstances that Mr. Stevens was desirous to avail himself of my new system of ventilation, for he had hitherto looked in vain for any relief from the troubles enumerated above. I found in his stable five very splendid horses, for one of which he had recently paid five thousand dollars. The stable I found to be almost destitute of ventilation, notwithstanding an ample flue put up at the head of each stall in the original construction of the building, and which the architect, without doubt, deemed all sufficient for the purposes of ventilation. There was also, in addition to the flues, a large trap or ventilator in the skylight; but with all of these contrivances, the atmosphere in the stable was of the most offensive character, and the poor horses, valued at a little fortune, were suffering for the want of a due supply of that indispensable element of life and health, pure, fresh air. I proceeded at once to ventilate the stable, and in a few weeks after the work was completed, I called upon Mr. Stevens to inquire what had been the result of the experiment. He assured me that it had worked splendidly, and that his stable now abounded with a pure, sweet and wholesome air. A great lover of that noble animal, the horse, as Mr. Stevens is known to be, I could not but observe the pleasure which he manifested in having been able to improve the sanitary condition of his favorite animals.

Deriving so much satisfaction from the introduction of a pure atmosphere into his stable, Mr. Stevens now had his attention recalled very forcibly to the sad condition of his kitchen, which, he said, abounded in offensive and unwholesome odors, and which, as is common in all similar cases, were constantly pervading the rooms above, and rendering his parlors, his art gallery, and other apartments extremely disagreeable. A ventilator, so called, had been placed in the flue, extending up from the kitchen, but it proved to be of no avail; and he had almost decided to tear down this flue and erect another in its place, extending to the height of five stories, with the hope that the defects herein

described might be obviated. He was gratified to find, however, that instead of an expenditure of five or six thousand dollars, which a new flue would cost, he could have his kitchen ventilated by my simple method at comparatively little expense. The work was commenced and speedily completed, and I had the assurance of my patron that the experiment was entirely successful, and that he was no longer troubled with an impure or disagreeable atmosphere in his private apartments.

Mr. Stevens next desired me to ventilate a large refrigerator which he used for his private purposes, and into which choice meats, game, and other provisions were placed for preservation. As he had become somewhat accustomed to the pleasures of a sweet atmosphere in his stable, kitchen, and private parlors, he had no difficulty in detecting the very impure atmosphere which pervaded this refrigerator. Indeed, upon opening the door, the air was almost sickening, and the idea of a dinner of sirloin or canvass-back was anything but agreeable. And here it ought to be borne in mind that no food is fit to be eaten which is confined a long time in such an atmosphere as here described. The provisions absorb the noxious gases which are present, and they are regarded by physicians as more or less poisonous to the blood and the whole system. Mr. Stevens was not to be censured for this sad condition of his private larder, for he knew not how to remedy the evil, and a peep into the refrigerators of our fashionable hotels, boarding houses, and private dwellings will frequently disclose an oder not at all suggestive of "Sweetbriar" or "Verbena." Some months after ventilation had been established in the above refrigerator, I was informed that not a pound of meat, poultry or game, had been lost since the experiment was commenced, whereas previously to that time many of the articles put into it had been spoiled.

In due time I called upon Mr. Stevens to ascertain whether my labors in his behalf had proved satisfactory, and if so, whether he would favor me with a letter setting forth this fact to the public. Without any reserve, he replied: "Certainly, with great pleasure, because you are doing good to the public, and it is my duty to inform the public of the services which you are capable of rendering them. If I were not lame," added Mr. Stevens, "I would go about and advertise you myself."

VENTILATION IN NEW YORK HOTELS—ALBEMARLE—BREVOORT HOUSE—ST. JAMES'—ST. NICHOLAS—BRANDRETH HOUSE—MERCHANTS' HOTEL—WESTERN HOTEL—STEVENS' HOUSE—INTERNATIONAL HOTEL.

The New York hotels are probably unrivalled on the score of excellence and popularity. This is because they are usually managed by *wide awake* men, who comprehend the public wants, and spare neither labor nor expense in adding to the attractions and substantial improvements of their establishments. Thus I am enabled to acknowledge, with equal pride and pleasure, the liberal patronage which has been bestowed upon me by the hotels in question. I have established ventilation, of one kind or another, in each of the hotels enumerated above, and in the order in which they are named.

The *Albemarle* was the first to show its appreciation of my new mode of ventilation, and there is now within the establishment one of my large *refrigerators* or *provision houses*, divided into apartments, each one of which is intended for the reception of some particular article of food, as fresh meat, cooked meats, fish, butter, pastry, &c.

The *Brevoort House* has been liberal in its patronage, having within the establishment a large meat house, and a large refrigerator, divided into apartments, like the one mentioned above. One of these is used for the reception of *cut meats*, so that they may be ready at a moment's notice, when ordered by a guest; another for *cold meats;* a third for *jellies*, *pastries*, *ice creams*, &c.; and the others for fish, butter, &c., as already named.

The *Fifth Avenue Hotel* would be about third upon the list, but is not here included, because it has been specially mentioned in the last section, in connection with Mr. Stephens.

In all of the other hotels there are large ventilated meat houses, so that the travelling public need not be in ignorance of the hotels at which they may obtain superior roast beef, or savory steaks and chops. For my own part, I would prefer a third rate hotel, with one of my ventilated meat houses, to a first class establishment, if it may be so termed, without any such improvement.

In the *Belmont* the *dining room* is ventilated; and this is the only public dining room which I have had the pleasure of ventilating. It was rendered extremely unpleasant by the smoke and misty vapors and odors from the kitchen, the atmosphere being so clouded at times that

one could scarcely discern the face of a friend a short distance off. To remedy this difficulty, ventilation was established, which proved, according to the Certificate of the proprietor, which may be found in another place, "a complete success." The atmosphere, at all events, is free from smoke and kitchen odors.

PORK HOUSE VENTILATION—MESSRS. SILVERHORN, MILLEMANN & LOCKETT —PORK CURED AT FIFTY DEGREES OF TEMPERATURE.

A large proportion of the people of the United States, having no special regard for the old Mosaic law, are great lovers of pork, and consequently the pork business is a thriving and profitable branch of trade. This presupposes the necessity of pork houses for curing and preserving the meat, and as the dealers frequently have from twenty to one hundred thousand dollars of their stock on hand at a time, the question of perfect ventilation is an important one, especially as thousands of dollars worth of the meat is liable to spoil in a very short time.

Among my earliest experiments in ventilation was one for Mr. Silverhorn, in New York city, in 1862, who conducted a large pork establishment. By reference to his card at the end of this pamphlet, it will be seen that the experiment was successful. The foul and damp atmosphere of his cooling rooms was replaced by one perfectly dry and pure; his men ceased to complain of sickness; and he found his pork curing as well in summer, with the aid of my ventilating process, as it had done in winter at a temperature of thirty-eight or thirty-nine degrees. I may add that there has been no instance of pork going into one of my ventilated houses in a sound and sweet condition that was not found equally sound and sweet when taken out.

In 1863 I ventilated the pork house of Mr. Millemann, who had been in the business forty years, and who had had ample experience with regard to the various methods of cooling and ventilating pork houses. Observing the thermometer as high as fifty degrees, under my direction, he became very much alarmed, as he had $40,000 worth of pork on hand, and he had been accustomed to as low a temperature as thirty-eight or forty degrees. He found, however, that his pork cured better at fifty degrees than it had ever done with lower temperatures by the old methods. [See his card in another place.]

It may be inferred, therefore, that I use much less ice than is necessary in the old method. The most experienced dealers in pork

deemed it requisite to have a temperature in their pork houses of about thirty-six or thirty-eight degrees, but certainly never exceeding forty degrees; and when I proposed to employ a temperature of only fifty degrees, every one of them seemed to regard it with extreme skepticism. Hence it will be seen that it is the lack of ventilation in the old method which hastens the destruction of the meat, and that by ventilating efficiently, so as to carry off the foul air rapidly, the pork may be cured and preserved at a much higher temperature.

Joseph Lockett, one of the largest and most experienced English pork packers in the country, deserves to be mentioned in this connection. He availed himself of my apparatus in one of his cooling rooms as an experiment, and finding that it afforded a perfect ventilation, as will be seen by reference to his card in another place, he had it applied consecutively to all of his rooms. There can be no better authority upon the subject of pork house ventilation, than that of Mr. Lockett.

VENTILATION OF STABLES—HORSES SICKEN AND DIE FROM BAD AIR—ZOOLOGICAL GARDENS—VARNISH OF CARRIAGES DESTROYED—COW STABLES—POISONOUS MILK—STATEMENT BY PROFESSOR DOREMUS.

The ventilation of stables intended for the accommodation of our domestic animals, and especially the horse, is a matter of very great importance. It is claimed by those who have had ample experience, that there are more horses dying annually from imperfect ventilation than all other causes combined. Bad air is known to produce blindness in horses, which is becoming very prevalent, especially in New York city, where horses are often crowded together in very small stables. A horse is frequently valued at five or ten thousand dollars, and sometimes more, and it is surprising that the owner of so valuable and noble an animal should ever endanger its health or life for the want of proper ventilation, which would cost but a trifling comparative sum. A horse, with its large, vigorous lungs, requires a large amount of fresh air, which it is impossible for it to obtain in a close or illy ventilated stable, especially when several animals are crowded together in a small space. The horse then begins to droop and show signs of disease; his ears grow cold; his eyes lose their brilliancy, and finally his sight becomes impaired; his step becomes less firm and elastic; and when he is taken from the stable, it is not until he has had time to take in copious draughts of pure, fresh air, that he begins to brighten

up or manifest his usual vigor and animation. A horse is almost as susceptible to the influence of fresh air as a human being is to that of laughing gas, and in proportion as he is deprived of it, in that proportion will his health and usefulness be impaired, even though his life may not be destroyed.

A brother of mine in Boston, some years ago, had a valuable horse which became sick in consequence, as it was believed, of a poorly ventilated stable. Its life being dispaired of, it was arranged to send him to a veterinary surgeon in Cambridge, just across the river from Boston, for treatment. Three men were employed to conduct the animal to his new quarters, one to lead him, and the other two to support him on either side, as he was liable, from his great exhaustion, to stagger and fall to the ground. The bridge by which the river is crossed was finally gained, and here the horse appeared to be reviving under the influence of the pure air sweeping across the bridge. His step was gradually becoming more firm and elastic, but all at once he came to a sudden pause and threw up his head as if some new element of life had been infused into his veins. He stood quietly in this position for several minutes, with an appearance of delight and pleasure, and seemed to be instinctively taking into his lungs full draughts of the fresh air which he had so much needed, and which so revived him that in a short time he proceeded over the bridge with a vigorous step, without any support from the men in attendance. Let it not be forgotten, then, that fresh air is just as important to a horse as his food or drink.

"The effects of air, vitiated by animal effluvia," says Mr. Tomlinson, in his Rudimentary Treatise on Warming and Ventilation, "is evident in the diseases of the lower animals when crowded together in confined places. The glanders of horses, the pip of fowls, and a peculiar disease in sheep, all arise from this cause, and it is stated that, for some years past, the English nation has been saved £10,000 a year, in consequence of the army veterinary surgeons adopting a plan for the ventilation of the cavalry stables."

The same writer quotes the well known Dr. Arnott, who alludes to the want of knowledge among all classes on the subject of ventilation, and states that he had heard at the Zoological Gardens of a class of animals where fifty out of sixty were killed in a month from putting them into a house which had no opening in it but a few inches in the

floor. It is pointedly added that this was like putting the animals under an extinguisher.

A noted lawyer of New York, whose name I do not feel at liberty to give in these pages, applied to me to ventilate his stables, saying that he had just sold, or more properly given away, a pair of horses, for which he had recently paid $6,000, in consequence of their sight becoming so much impaired as to render them nearly useless. He attributed the disaster to imperfect ventilation, but did not know how to remedy the difficulty. He had employed a leading architect to ventilate his art gallery, library, kitchen, &c., but his efforts were fruitless, and he was very zealous in the hope that I might produce better results by my improved system of ventilation.

I have ventilated a great many stables belonging to the wealthy citizens of New York, and always with entire success. The atmosphere of those stables is generally stifling and offensive in a marked degree, and that horses confined within them should become blind, or sicken and die, need not excite our wonder. When those stables are properly ventilated, the air within them is always sweet and wholesome, and the horses are in no danger of losing their health or their lives.

There is another reason why horse stables should be ventilated. The air within them is charged with ammoniacal vapors, which is not only injurious to horses, but tends to destroy the paint and varnish on carriages in a very short time. I have ventilated stables from this consideration alone, having no reference to the health of the horses.

*Cow Stables.*—These, as well as horse stables, should be well ventilated, for milk is an indispensable article of food, and no cow can furnish wholesome milk if she is forced to breathe a foul or contaminated air. We need not expect to find pure milk where we have not pure air. The poison of contaminated air finds its way through the lungs into the blood of the animal, and the milk inevitably partakes of the poison. Much of the milk sold in New York is of this poisonous character. For illustration, I would refer to "an inspector's report of the cow stable nuisance," as given to the public through the daily papers by our new Health Board. The stables referred to were devoid of light, ventilation, and sewerage, being overcrowded and overheated, with filthy, disgusting stalls, and a filthy condition of the animals themselves. The yard, says the report, was filthy and wet, made so by the manure, urine, and water, which emitted a vile odor. These offensive

matters flowed through a ditch into a "a good sized stagnant pond," which occupied the ground, constituting "a decided nuisance, pernicious to health and comfort." So says the report. The owner of the cows, whose name is to be seen upon his milk wagons, is A. Dettinger, Fiftieth Street, between Ninth and Tenth Avenues. If this Mr. Dettinger should be punished, we think it would be sufficient to force him to drink the milk from his own cows.

*Professor Doremus*, in a lecture lately delivered before the Free Academy, in this city, on electricity as a motive power, suggested that a new electric engine, invented by Mr. L. C. Stewart, to which he called special attention, might be found useful in propelling the street cars, instead of using so many horses, and remarked incidentally, that the presence in our city of one hundred thousand horses, or more, with their accumulated fecal and renal secretions, constantly exhaling a foul odor into the atmosphere, must have more or less of a pernicious influence upon the health; and he thought it would be well, in a sanitary point of view, if we could dispense with some of our horses, and use a motor such as the above in their place.

### PALACES AND STABLES IN NEW YORK CITY—A WORD ABOUT "FRESH MILK"—PEEVISH MOTHERS.

We copy the following article, under the above title, from Dr. Morris Mattson's "Facts for the People," &c., from which we have previously quoted upon the subject of foul or noxious air:

"New York city being the great commercial emporium of the United States," says Dr. Mattson, "we have a great deal of wealth, with all of the refinement and luxury which usually accompanies it, and particularly very splendid up town residences, which are sometimes designated *palaces*. This is all very well, but when it is found that these palaces are frequently in close connection with *horse and cow stables*, one begins to lose his relish for what may be considered the fascinations and charms of fashionable life. If indeed, one is a lover of pure, sweet air, one would be more likely to sigh for a cottage upon the hillside, than a palace in the city.

"But our chief business, in this article, is to speak of a certain up-town palace, owned by a certain wealthy gentleman, who was the owner also of four or five splendid horses, costing him five or six thousand dollars apiece, and an equally splendid cow, which he had selected from

the finest breeds, and for which he paid an exorbitant price. The horses were to gratify his own taste, the cow to gratify the taste of his wife, who had frequently told him that there was nothing so desirable as '*fresh milk*' for the coffee, and fresh milk also for the children. She had heard about slop fed cows, and had no notion of using milk which came from such questionable sources; she wanted pure, fresh milk from a cow of her own.

"This all looked very reasonable in theory, and the indulgent husband, having purchased the animals in question, was obliged to have a stable for their accommodation. But where to locate it was a difficult question to answer. He knew it was fashionable for New York millionaires to have stables adjacent to their houses, and he had no objection to being in the fashion, in this particular, but unfortunately, he had no spare ground upon which to erect a stable. After due consideration, there seemed to be but one alternative remaining, which was that of placing the stable *under ground;* and one of his poetical neighbors assured him that this was a 'brilliant conception,' inasmuch as the stable would be *out of sight*, and *out of the way*. The thought was not entertained for a moment that cows and horses need an abundance of fresh air; that this fresh air, with its vitalizing oxygen, is quite as important to them as their daily food and drink.

"The stable was finally completed, under the superintendence of a noted architect, who had it furnished with a number of 'ventilating flues,' which, however, in accordance with one of Dr. Franklin's notions, seemed more inclined to '*draw downwards*' than *upwards*. In due time the cow and the horses were installed in their new quarters; but scarcely a week had elapsed, when it was discovered that the stable was emitting a most disagreeable odor. The 'ventilating flues' did not seem to be rendering much service. It happened about this time, that the gentleman of the palace was taking a walk before sunrise, scenting the keen, pure air of the morning; and upon his return, he very naturally opened the stable door to look in upon his splendid cow and favorite horses; but, alas, his unwilling nostrils were saluted by such a perfume from the enclosure, as to render him quite uncertain as to whether he would require any breakfast, and he was not at all sure that the '*fresh milk*' from the cow, of which his wife had said so much, would be particularly agreeable in his coffee.

"Time passed on, and the cow began to droop and sicken; the

horses also looked dull, weary and jaded, with all of the signs of disease, and it was deemed expedient to consult a veterinary surgeon in regard to their health. All this time the poor animals were sickening because they had not enough of pure air to breathe, and the atmosphere which was generated in this close and confined stable, was too horrible for description. Escaping from the enclosure, it permeated the house, and was enough to sicken the whole family. Meanwhile, the milk of the cow was still used for family purposes, was given to the children, was put into the tea and coffee, and all without a suspicion that the milk was literally a poison. A cow cannot yield pure milk unless she has pure air to breathe; shut her up in a close stable, so that the air about her will soon become contaminated by the poisonous carbonic acid gas from her lungs, and the foul emanations from her body, and she will soon show unmistakeable signs of disease. Her milk, in the meantime, will partake of the disease of her body; indeed, it would seem as though the udder of the poor sick cow was a sort of *drainage* whereby nature sought to relieve her general system of some of its impurities. These impurities become incorporated with the milk, which is unfit to be taken into the human stomach. Every intelligent mother knows that her milk is influenced by the condition of her system. If she is peevish and fretful, (from well assigned causes, perhaps,) her nursing child will be peevish and fretful; if she partakes of food which deranges her digestive organs, her child will be sure, almost, to suffer similar derangements; if she swallows a cathartic, the cathartic effect of the drug will be manifest in the child through the influence of her milk. The cow is no exception to the rule, and her milk should never be given to tender infants and young children without feeling assured that the animal is perfectly healthy.

"Stables, such as we have described, have frequently been ventilated by Mr. Gouge, rendering the air pure and sweet, which is a great boon to the poor animals enclosed within them, and an equally great boon to the families to whom they belong, for, living in palaces, they should enjoy the comfort, and pleasure, and delight which properly belong to palatial residences, of which pure air is the first and most important item.

"Houses and stables should not be adjacent to each other, or the latter, to say the least, should be ventilated in accordance with the plan which has been proposed and successfully executed by Mr. Gouge."

### WATER-CLOSET VENTILATION.

Many of our finest houses are rendered almost intolerable by the water closets, the foul odors of which may be detected from the basement to the attic, and yet the remedy is perfectly simple and easily applied. The unwholesome odors and gases may be readily exchanged for the sweet pure air. In my mode of ventilating water closets, the foul air *beneath* the seat is made to ascend through a flue, by means of a rarified atmosphere, carrying with it cigar smoke or other disagreeable odors *above* the seat, or within the enclosure or apartment in which the closet is located; and thus, the mingled impurities of the atmosphere, so offensive to the sense of smell, and so injurious to the health, are scattered upon the wings of the wind. I have ventilated numerous closets for our wealthy families, and always to their great delight and satisfaction.

### SMOKING ROOMS—REGARD FOR THE HEALTH OF YOUR WIFE AND FAMILY.

These should always be ventilated, whether they exist in public places or private houses. Even the accustomed smoker would be better not to inhale over and over again the smoke emitted from his cigar or pipe. Nor is the idea a very pleasant one of taking into one's lungs the tobacco smoke which proceeds from the mouth of another, mingled usually with an offensive breath, and not unfrequently the noxious effluvia from ulcerated gums and decaying teeth. No true gentleman, who seeks the indulgence of his cigar, will allow himself to inflict the smoke upon others who may regard it as a nuisance. Hence ventilation is necessary; and in that case you may smoke your cigar in the presence of your wife or daughter, or some anti-tobacco friend, without creating a feeling of unpleasantness or disgust. Where smoking rooms are not ventilated, the paper upon the walls, the furniture, and every thing within the room, become saturated with the smoke, and are rendered very disagreeable. Many fine houses have been ruined by excessive cigar smoking, as the walls and wood work retain the tobacco odor for a long period. Besides, your dresses become so tainted by the smoke as to render you disagreeable, in many instances, to ladies and gentlemen seated near you in cars, omnibuses and public places Every consideration then of refinement and delicacy, with a due regard for the comfort, well being and health of those about you, should either prompt you to give up the habit of smoking, or to have your apartments ven-

tilated so as to conduct the smoke quickly away. Even the health of your wife may suffer from the poisonous effects of your cigar; and yet she may not complain, as she does not wish to deprive you of any of your enjoyments. Rooms ventilated by my process are at once freed from the smoke, as well as any other impurity in the atmosphere, so that there is no taint nor disagreeable odor left behind.

### SUB CELLARS, BASEMENTS, ETC.—GOODS SAVED FROM RUSTING.

Cellars, Basements, &c., may be supplied with a pure and dry air by my process of ventilation, so as to be fit places of abode, or suitable for the storage of goods which otherwise might be injured by the dampness. Attention to this matter would be the means, oftentimes, of saving thousands of dollars to the merchant, by the preservation of his goods, to say nothing of the preservation of the health and lives of the occupants of those places.

There was a basement some years ago in Courtlandt Street, adjoining the Western Hotel, devoted to the sale of "Yankee Notions," in which were included many articles of hardware, which, owing to dampness, rusted badly, so that a large amount of property was destroyed, or rendered unsaleable. In addition to this, a very useful employee of the establishment was constantly indisposed and finally left his situation, believing that the place was unhealthy. Under these circumstances I was employed to ventilate the place, and after my task was accomplished, there was no more rusting of the goods, and the invalid employee returned to his post without making further complaints of ill health.

### FRUIT ROOMS—PRESERVATION OF FRUIT IN ITS NATURAL STATE—STRAWBERRIES KEPT TEN DAYS, AND RIPE PEACHES THREE WEEKS.

Millions of money are expended annually in the cultivation and perfection of fruit, which is becoming almost a mania with many of our fruit growers; and out of this has arisen a heavy and profitable business in fruit.

Fruit rooms are needed by all dealers in fruit, by the keepers of hotels and restaurants, by exporters of fruit, and by families who purchase fruit in considerable quantities as a luxury. The fruit thus accumulated is worth hundreds, and frequently thousands, of dollars, and as it is extremely liable to perish, it is important to improve the

method by which it can be preserved. What is required for this purpose, is a pure dry air, and the instant abstraction, as soon as it is formed, of every noxious gas, along with a properly regulated temperature ; all of which conditions are furnished by my mode of ventilation. Strawberries, which are the most perishable of all the fruits, have been kept in a good condition for ten days, and ripe peaches for three weeks. These experiments have been made repeatedly, and particularly by Mr. David Tilton, of the Tompkins market, so that there can be no doubt of the correctness of my statement.

Mr. Tilton was so well pleased with his success in preserving perishable fruits, that he employed me to construct a *fruit house* for him on board of the steamer Liberty, Capt. Wilson, about to sail for Havanna, for the purpose of exporting peaches and pears to that city. Let it be here understood that three quarters of the peaches and pears forwarded to Havanna, although packed in ice with great care, perish before their arrival at that port. I constructed a house for Mr. Tilton in the hold of the vessel, (the last place that would be dreamed of for the preservation of delicate and perishable fruits,) large enough to receive four hundred baskets of peaches and Bartlett pears. The fruit was duly put on board, but with the belief of every body but Mr. Tilton and myself, that but few, if any, of the peaches and pears would ever arrive in a sound condition at their place of destination. This opinion was regarded as all the more plausible because the fruit was in the hold of the vessel, where we expect to find the odor of bilge water and various noxious gases. The vessel sailed, and in nine days the fruit was taken out of the house in which it had been enclosed, and with the exception of about a peck of peaches, in close proximity with the ventilating pipe, it was found in a perfect condition, and according to Mr. Mills, the steward, (who, by the way, had prophesied that not a single peach nor pear would ever reach Havannah in a sound state,) it could have been returned to New York in an equally good and wholesome condition. The secret of this desirable preservation of fruit lies chiefly in the ready abstraction from the fruit chamber of every noxious gas, which, if permitted to remain, would cause the speedy destruction of the fruit.

### SHOW WINDOW VENTILATION.

In many cases this is exceedingly important. With proper ventilation, the moisture is prevented from accumulating upon the glass,

which freezes when the weather is sufficiently cold, and renders the glass impervious to the sight. Besides, the freezing is liable to fracture the glass, which is usually quite expensive. A pane of glass in one of the show windows of the International Hotel, New York city, was fractured in this way, and could not be replaced short of several hundred dollars.

My mode of ventilating a show window is different from that employed in any other kind of ventilation, although the principle is obviously the same. The store connected with the window may, if desired, be ventilated, as well as the window itself, and a pure, dry air furnished to the whole of the connecting apartments.

A show window not ventilated is a hot, dry place in summer, and goods displayed in it are frequently injured, or rendered unsaleable. Straw goods are liable to be injured, and silks and ribbons have their colors changed Meat and poultry hung up in windows for display, are in much danger of spoiling. The very choicest goods which a store can produce, are generally placed in the show windows; and it is desirable that they should be preserved from change or injury. This may be accomplished by my system of ventilation, which has been successfully adopted.

### REFRIGERATORS.

Refrigerators of the smaller sizes abound in the market, and are purchased largely by families on account of their cheapness. Some of them claim to be ventilated, but it is in a very limited degree, and consequently articles of food cannot be preserved in them for a long period. Every refrigerator, whether large or small, should be *perfectly ventilated*, whereby all the noxious or unwholesome gases which are constantly forming are carried off, and pure, dry, cold air furnished in their place. It is only under these conditions that food is wholesome, or fit to be eaten, for if foul air is allowed to accumulate in the refrigerator, it will be absorbed by the food, and its healthful qualities more or less impaired. It is the presence of this foul air which causes food to undergo decomposition, rendering it thereby unfit for use.

Refrigerators of a small size may be ventilated by my method but I do not pretend to furnish them to the public. Refrigerators on a large scale, however, together with fruit and provision closets, and meat houses, I am always ready to construct to order, and I have no

evidence that they can be thoroughly and efficiently ventilated excepting by the plan which I have secured by my Letters Patent.

The air is always pure, sweet, and dry in my ventilated refrigerators, and I have stated elsewhere that fresh meat will keep within them, during the hot weather of summer, for three weeks, and retain in the meantime its red color; strawberries will keep ten days; ripe peaches and delicate pears will keep three weeks, or longer, and so on to the end of a long chapter. The odor of one kind of food, however strong, will not be imparted to any other, because the odors and gases, as already explained, are not retained sufficiently long to undergo absorption by the provisions present.

The reader is referred to my Certificates, in another part of this pamphlet, in proof of my assertions, and I only ask of the public to judge me by my works.

FACTS CONCERNING THE PRESERVATION OF MEAT, BUTTER AND MILK—VENTILATED MILK AND BUTTER HOUSES—TESTIMONY OF MRS. G. S. ROBBINS.

It is a curious fact that fresh meat, suddenly frozen, will undergo a destructive change in its central or interior parts, so as to be unfit for use. Dr. Kane mentions a similar fact as taking place in the Arctic regions, with the thermometer fifty or sixty degrees below zero. The walrus, and other meats, which he was enabled to obtain in those high latitudes, freezing suddenly, underwent decomposition in the interior, greatly to his surprise, and could not be used as food. The pork packers acknowledge the loss of pork, now and then, from a similar cause. I know of but one explanation of the phenomenon. The frozen crust of the meat is probably impervious to the gases of the interior, so that they cannot escape, and decomposition ensues precisely in the same way that fresh meat decomposes or putrefies in a close, unventilated refrigerator, notwithstanding the presence of ice. One thing at least is very apparent, namely, that in preserving fresh meat, we need something more than a cold atmosphere, and I have elsewhere stated that in my ventilated refrigerators a temperature of only fifty degrees is all that is required for the preservation of fresh meat.

In contrast with the facts above stated, it is equally curious that in some sections of our country, and also in some parts of Mexico, fresh meat hung up in the open air, without any salt, even in the hot weather of summer, will not undergo any unfavorable change, but gradually

dry up and remain fit for food. The explanation is that certain prevailing winds sweep away all of the gases exhaled by the meat, as fast as they appear, so that there are no noxious agencies remaining by which the meat can be decomposed.

There is a curious fact also, in relation to milk, the interior portion of which frequently becomes sour, while the exterior portions continue sweet. This change takes place, notwithstanding the milk may be placed in a cold refrigerator, and the change occurs more speedily when the vessel containing the milk is closely covered. This difficulty in relation to milk has induced many of our citizens to apply to me for ventilated milk houses, which they have used with much satisfaction, and which should have a place in every hotel, restaurant, and private family.

Butter, as well as milk, is extremely sensitive to the influence of a pent up and foul atmosphere, such as we usually find in refrigerators. A foul or strong odor will taint the very best butter in a very short time. Those who are using my *ventilated butter houses* and *refrigerators*, have no trouble in keeping their butter sweet and good for a long period of time.

With regard to the preservation of milk, I might quote several authorities, but will content myself with that of the well known Mrs. G. S. Robbins, who deserves so well of her country for the noble services which she rendered to our suffering soldiers at the McDougall Hospital, at Fort Schuyler. One of my large refrigerators was placed in the Hospital through her influence, and after the use of it for six months in connection with the "Ladies' Kitchen," she says—"It is certainly a most admirable invention, enabling us to keep, in the most perfect preservation, during the unusual heat of the past summer, *milk*, poultry, meats, fruits, vegetables, &c., with, as I have frequently heard the steward remark, a very economical consumption of ice."

### BANKING HOUSES—JUDGE HILTON AND HIS STABLE—VENTILATION OF THE NEW YORK BANK—PURE AIR A VALUABLE PANACEA.

Banking houses are usually much in need of ventilation, because the directors, cashier, clerks, and others employed undergoing much severe labor, need a full and constant supply of fresh air; it is equally important that the poisonous carbonic acid gas which is given off at every breath from their lungs, and the poisonous effluvia also which is

exhaled from their bodies, should be carried speedily away from the apartments; for if breathed over and over again, as is always the case where ventilation is deficient, the blood, according to the testimony of physicians, undergoes deterioration, and disease is often an inevitable consequence.

The well known *New York Bank* may be mentioned as an instance of this imperfect ventilation, which came to my knowledge through the instrumentality of Judge Henry Hilton, of New York city, whose stable I had ventilated very much to his satisfaction. Owing to this circumstance he was kind enough to give me a letter of introduction to the Cashier of the above Bank, the well known Mr. Meeker, suggesting that it would be well to employ me to ventilate the place. I found that the frequent complaints of its imperfect ventilation were well founded. The atmosphere was extremely close and vitiated. Much had been done to ventilate the place, but all efforts had proved unsuccessful. A number of flues had been constructed so as to open into the Cashier's room, with the hope of obtaining adequate ventilation, but it answered no good purpose. I proceeded at once to put my system of ventilation into operation, and it was no sooner accomplished than every person employed in the Cashier's room perceived an immediate and almost magical change in the atmosphere. Compared with the depressing influence of the foul air which they had been so long accustomed to breathe, it was like some delicious and renovating ether; and it had the effect, as I am informed, of restoring one of the clerks, who had been for a long time an invalid, to very good health. I have not thought of availing myself of my patent as a means of curing disease, but I get such marked and brilliant results, now and then, in that direction, that I feel constrained to speak of *pure air* as one of the very best remedies or panaceas which we possess.

### WASHINGTON CITY POST-OFFICE—A FACT FOR THE SKEPTICAL—ORDERS FROM JAY COOKE AND GEO. W. RIGGS, THE NOTED BANKERS.

Post-offices, like banking houses, need ventilation now and then. The mail bags and leather pouches, when exposed to a damp atmosphere, are liable to become mouldy, and the atmosphere itself is very objectionable to those who have any regard for their health. All that is here said will apply to the post-office in Washington City, which I had the pleasure of ventilating, and I cannot well refrain from append-

ing the following letter by the Hon. S. J. Bowen, the postmaster. The letter was written to a gentleman in New York city, without a suspicion, so far as I know, that it would come under my observation.

WASHINGTON, December 20, 1865.

Mr. GAY: There has been in operation in the Post Office in this city one of Gouge's Ventilators for the past two months. It was put in for the purpose of ventilating the basement in which are stored the mail bags and pouches, from which a supply for other offices is drawn.

Before the Ventilator was put up the air in the room was damp and impure, so much so as to be very disagreeable and unhealthy to persons remaining in it any length of time; and the leather pouches would be covered with mould and the sacks and bags with mildew. The Ventilator has removed both the bad air and the dampness, and a person can discover no difference in the air from that in the rooms above. The pouches and bags are now perfectly dry, and we think the Ventilator has already saved to the Department double its cost in preventing injury to them.

It was put up as an experiment, to be paid for if it succeeded. We would not have it removed for any consideration whatever. I think it will be very generally adopted in this city. Truly yours, &c.,

S. J. BOWEN, *Postmaster*.

The experiment of ventilating the Washington Post-office having been entirely successful, it attracted the attention of Jay Cooke and Geo. W. Riggs, the noted bankers, who were so much pleased with what had been done, that each one complimented me with an order to ventilate his banking house in Washington city.

### BANK VAULTS.

These are not unfrequently pervaded by a damp atmosphere, which causes books, papers and documents to become mouldy. Proper ventilation will render the air pure and dry, so that there will be no tendency of the books and papers to mould.

### POWDER MAGAZINES.

These magazines, I am informed, are very liable to become damp, which injures the powder, destroying its granular condition and causing it to form into concrete masses. An ordnance officer at the Brooklyn Navy Yard, who had acquired some knowledge of my system of ventilation, suggested to me that it would be likely to prove valuable in connexion with powder magazines, and confirmed what is mentioned

above in relation to the powder. He felt persuaded that my *atmospheric ventilator* would obviate every difficulty, and save much money to the government and others who deal in the article. He spoke in commendation of another feature of the apparatus, which, no doubt, would be a desideratum, namely, the safe and efficient light which it would afford to the interior of the magazine. This light, it may be added, would be free from all danger of causing an explosion of the powder.

### SAILING VESSELS, ETC.—COMMODORE FOOT.

My method of ventilation can be applied to sailing vessels, steamboats, emigrant ships, &c., as easily and successfully as to schoolrooms, churches, kitchens, sleeping rooms, or parlors, and yet I have never had an opportunity of ventilating a sea-going vessel. I was applied to by Commodore Foot, just previous to his death, to examine the receiving ship North Carolina, lying at our Navy Yard, which he was very anxious to have ventilated, but the matter was referred to the authorities at Washington, and before it was decided, the death of Commodore Foot took place at the Astor House. Since then there has been no action in the matter. I hope I may yet have an opportunity of rendering my services in this species of ventilation.

An old sea captain tells me that the hold of a ship, in which the cargo is principally stored, is sure to become very damp, if ventilation is not resorted to, and a copious condensation of moisture will take place on the under surface of the deck and the sides of the vessel. The water thus condensed will fall from the deck upon the cargo and injure or destroy all perishable goods, as silks, cloths, sugars, teas, &c. As efficient ventilation would prevent the difficulties here spoken of, merchants and shippers might save themselves from heavy losses without much expenditure of money. Ventilation would also preserve the timbers of a ship, which are rotted by foul air. Ships, it would seem, are sometimes completely rotted by foul air within the short period of three years. It would certainly be economy for every ship owner to incur a slight expense in ventilating his ship, rather than to take his chance of its total destruction.

### CHURCHES—A NEW MODE OF VENTILATION TESTED—ANECDOTE OF A DISTINGUISHED CLERGYMAN.

If it is not desirable for people to go to sleep during divine service, then it is important to ventilate your churches. It is not always dull

sermons that make people drowsy; it is much more frequently the foul air of a church, which deadens all of the faculties of the mind, and induces that drowsy condition, so unpleasant to the individual, and yet so difficult to be overcome. Sleepiness in church, and in other public places in which human beings are densely packed together, is not dissimilar, in many instances, from the sleepiness and stupor induced by breathing the carbonic acid gas emitted from a charcoal furnace in a close room. The lungs of the auditors are indeed so many charcoal furnaces, throwing out every instant copious volumes of carbonic acid gas; and as churches are seldom or never ventilated, it is no wonder that people go to sleep. The only wonder is that they do not frequently go to sleep never again to wake, and it will yet be found and acknowledged by those who investigate hygienic and sanitary laws, that human life is frequently shortened by a slow and gradual process of poisoning, induced by the noxious air of churches and other public places.

It is my privilege, I trust, though I do not do it with any captious spirit, to speak of a well known church in which a new experiment in ventilation was tried. And, by the way, if ever a church needed ventilation, it was that one. It is densely crowded, particularly in the evenings, and if any one wishes to know how much *bad air* he can inhale, in the course of two hours, without undergoing positive suffocation or asphyxia, he has only to make an evening visit to said church. The board of trustees finally concluded that a little less carbonic acid gas, and a little more pure, fresh air, would be a desideratum; and in accordance with this wise decision, they agreed to avail themselves of the services of an educated and distinguished gentleman who had introduced a new mode of ventilation, which was highly applauded by some of our popular journals. Explanations were made by him to those interested; plans were drawn upon paper, and everything pertaining to the new method seemed to promise entire success. The experiment was duly undertaken; a large number of men were employed; the parties worked diligently for three months, and, as a matter of course, used up a large amount of money. Unfortunately, however, for some unexpected reason, the experiment did not work well, and finally, for the want of additional funds, the enterprise was suspended, never again to be resumed.

Anxious to learn the particulars of the above experiment, and accidentally meeting the distinguished pastor of the church, with whom I

had not the pleasure of an acquaintance, I nevertheless took the liberty of interrogating him upon the subject. Pausing for a moment, he made this sententious, emphatic, and characteristic reply, the words of which I can put on paper, but without giving any idea of the peculiar inflections of his voice, or the curious blending, as it seemed to me, of the humor and pathos which he infused into his answer. He said—"They have been at work *three months;* they have expended *three thousand dollars;* and they have not got fresh air enough into the church to feed *three flies.*"

I have had an informal application to ventilate the above church, and if an arrangement should be made, I will agree—my motto being "No success, no pay"—to ventilate the church efficiently for much less than the above amount, or charge nothing for my services. I would so arrange the ventilation as to furnish an abundant supply of pure and warm air in the winter, while in the snmmer the heat radiated from the numerous gas burners should not be felt. I would also relieve the congregation from the uncomfortable draughts of air proceeding from the windows in the galleries, which are thrown open during the services for the admission of fresh air in order that the people may not actually undergo suffocation.

Let this church be properly ventilated, and the noted pastor, though he may not be more eloquent and impassioned, will be likely to add ten additional years to his pastoral life. Constant dropping, it is said, will wear out a stone; and so the breathing of foul air, at frequent intervals, along with great physical and mental effort, cannot fail to make an ultimate impression, even upon the healthful and vigorous system of the pastor in question. It was found that the soldiers in the English barracks, near London, in consequence of imperfect ventilation, did not live as long by ten years, upon an average, as the agricultural population, outside of the barracks, under similar conditions of life, excepting that they had a pure and wholesome air.

### INSUFFICIENCY OF FLUES OR CHIMNEYS AS A MEANS OF VENTILATION—ORIGIN OF CHIMNEYS—DIVIDED FLUES.

Chimneys are an old institution—so old, indeed, that we are unable to determine who was the inventor, or in what country they were first employed. We are told of chimneys in Venice before the middle of the fourteenth century; in Padua, before 1368; and of a certain lord

of Padua who came to Rome, and finding no chimneys in the inn where he lodged, because at that time fire was kindled in a hole in the middle of the floor, he caused two chimneys, like those that had long been used in Padua, to be constructed by the work people he had brought with him. But the claim of the Italians to the invention of chimneys is questioned upon the supposition that they existed in England as early as the twelfth century. However this may be, chimneys began to multiply during the reign of the Tudors, and the subject becoming invested with a sort of artistic interest, it was said that "the chimney shaft became a prominent and beautiful feature in buildings." A little later on, during the reign of Queen Elizabeth, chimneys were regarded as an indispensable "luxury"—that is the historic word—and apologies were made to visitors if they could not be accommodated with rooms provided with chimneys. Ladies, it is said, were frequently sent out to other houses in which they could enjoy, as already quoted, "the luxury of a chimney." We have sadly deteriorated since the reign of "Queen Bess," for, although three centuries have elapsed, our houses are so constructed that the existence of a room with a chimney is rather the exception than the rule. Hence, the question has been pertinently asked by a distinguished writer—"When will architects and builders be convinced of the fact that fire-places, as well as human beings, require constant supplies of fresh air, and that it is their duty to provide every room with air-channels, placed so as to feed the fire without annoying the inmates."

Although we have a better ventilation with a chimney than without it, yet it is incumbent upon me to point out the comparatively imperfect ventilation which a chimney usually affords. A chimney or flue is described by Dr. Arnott as a pump—"a sucking or drawing air-pump," which is relied upon as a means of producing an *upward current* of air, and thereby procuring efficient ventilation. But that it notoriously fails is confirmed by our every day experience. We find houses, stables, and public buildings supplied with chimneys, and yet we do not find good ventilation. I have spoken of the offensive condition of the atmosphere in the stable of Mr. Paran Stevens, and yet there was an ample flue at the head of each stall, with a large trap or ventilator in the sky-light. If flues could have been of service, Mr. Stevens ought to have had a good atmosphere in his stable. I have spoken also of the *New York Bank* as having a number of flues opening into the cash-

ier's room, but without any good result in the way of ventilation. I have ventilated so many foul places in which there were flues or chimneys, that I need no other proof of the total inadequacy of this mode of ventilation.

I have spoken of the *upward currents* of air in chimneys, and if we could have those upward currents continually in motion, the problem of ventilation would be solved, and we should be troubled no more with a foul or vitiated atmosphere. But instead of these upward currents, it is a fact that we frequently have *downward currents*, and here is the real difficulty. Chimneys are not always then a luxury, as in the days of Queen Elizabeth. It has been conceded by many distinguished writers, including Dr. Franklin, that the currents in chimneys are irregular, passing *downward* frequently as well as *upward*. It has been stated that chimneys situated in the north wall of a house do not draw so well as those in a south wall, because when cooled by north winds they are apt to "*draw downwards.*" Dr. Franklin has an elaborate explanation of what he terms the *ascending* and *descending* currents in chimneys, which vary according to the period of the day, or particular seasons of the year. I have frequently satisfied myself of the existence of those downward currents in the flues of horse stables, which I have so frequently ventilated for our wealthy citizens, and in which the atmosphere is usually very offensive. A gentleman of distinction, connected with the New York Historical Society, applied to me to ventilate the rooms of the Society, and stated that according to his experience and observations, currents of air *came down* flues or chimneys oftener than they *go up*.

A heated flue, it may be remarked, is of course more efficient than one not heated, but even this does not always furnish a good ventilation; and I desire, in this place, to invite attention to the important fact, that heat communicated to a chimney from a stove, furnace, range, or other fire, is far less powerful or efficient for ventilating purposes than heat originating directly *within* the flue. This fact lies at the foundation of all my improvements in ventilation, as will be explained more fully hereafter.

*Divided flues*, or what perhaps may be termed *double flues*, have had some reputation in this country as a means of ventilation. This we believe is an English idea engrafted upon our stock of American notions and devices. It presupposes an out draught of heated air from the in-

terior of a building, through one tube or flue, with an insetting current of the colder external air through the other tube. In cold weather we have, without doubt, such a result as this, but when the external air is only a few degrees colder than that within the building, we believe it is not claimed that the action within the tubes is such as to produce any perceptible ventilation. During the greater portion of the summer, therefore, we should be without ventilation, while in winter, we may have such a volume of cold air rushing into our apartments, as to render the atmosphere chilly or uncomfortable. The Legislative Hall at Albany was ventilated upon this plan in 1862, but I never understood that the experiment was successful.

OUR NEW METHOD OF VENTILATION EXPLAINED—DESCRIPTION OF CUT*—THEORIES CONSIDERED—ADAPTATION OF THE VENTILATOR—PROFESSOR DRAPER'S MODE OF VENTILATION—ADVANTAGES OF THE VENTILATOR—QUESTION FOR PHYSICIANS—OUR PATENTS.

When we deal with a motive power, and wish to produce practical results, we know that the *cause* must be equal to the *effect*. All systems of ventilation, therefore, which do not recognise an adequate motive power, must be failures; and thus we have had repeated failures in in this department of art and science, notwithstanding very plausible and apparently brilliant theories, which, in some instances, have seemed to captivate the judgment of able and distinguished men.

Theories should not be valued in reference to ventilation, unless it is shown that they are in correspondence with practical results of an unquestionable and satisfactory character. If a church, kitchen, parlor, stable, banking house, or other place, is to be ventilated, the first question should be, can the foul air be got out, and pure air be made to take its place. If the answer is yes, and the work is duly accomplished, it will be time enough to look after a theory, or to discuss problems in science and philosophy.

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* DESCRIPTION OF CUT, OPPOSITE TO TITLE PAGE.—A glass lantern. B, suction pipe or flue. C, opening in flue, near the floor, for the admission of air and carbonic acid gas. D, diaphram for regulating the admission of air to the gas jet. E, gas pipe and gas jet. G, interior flue for concentrating the heated air. H, ascending portion of ventilating flue. I, aperture in flue for admission of heated and vitiated air. J, register for opening or closing the aperture I. K, weather cap.

☞ The arrows indicate the up-moving currents of air.

When air is made to ascend through a flue in virtue of a positive, irresistible force, which has been created artificially, then, and not till then. shall we have a perfect ventilation ; and this desideratum accomplished, we need not trouble nor vex ourselves about the upward and downward currents of air in chimneys, or other nice theoretical questions or problems.

The motive force to which reference is made above, is the one through which our mode of ventilation is always accomplished. It consists of heated currents of air, which ascend through a flue, and by the strong ascensional power which is thus created, every vestige of foul air—every unpleasant odor—every atom of the noxious gases—are carried irresistibly away and scattered to the four winds.

The air within the ventilator is heated and rarified by a jet of burning gas, or other convenient flame, as already described, (see Description of Cut, opposite Title Page) and it is this device which we have secured by Letters Patent—which has enabled us to ventilate so many foul places to the entire satisfaction of our employers. We will assert again, that a jet of gas burning within a flue, has a remarkable power in rarifying the air and producing powerful up-moving currents. Heat communicated to a flue or chimney by a stove, or furnace, external to it, as previously stated, is not to be compared with this in its power of producing ascensional currents, and withal, cannot be employed so continuously, nor with so little expense as the jet of gas.

The apparatus, as a whole, with its lantern, flues, &c., constitutes what is termed "*Gouge's Atmospheric Ventilator*," and when properly adjusted, will effectually ventilate the dampest cellar or basement, the deepest subterranean vault, or the foulest "black hole" that can be imagined, or brought within the range of its power.

The *expense of the gas* used for ventilating purposes is trifling. Commencing with an ordinary burner, we soon establish a strong up-moving current within the ventilator, which, after a short time, can be maintained by a feeble jet of gas, not amounting to more than one foot per hour. Thus we have an efficient motive power, operating constantly, day and night, without the necessity of any supervision or attendance, producing the most satisfactory ventilation, and furnishing a full supply of fresh air to one's kitchen, stable, sleeping room, or other apartment.

Adaptation of the Ventilator, &c.—Simple and obvious as is the

principle of ventilation herein set forth, yet the proper adaptation of the apparatus to the various uses which the public require is often extremely difficult. Indeed, it is only by long experience, and a close application to the business in which I am engaged, that I have become successful; and I am free to confess that I have often made failures in my first attempts at ventilation, but in no instance have I ever abandoned a task which I had undertaken until I succeeded to the satisfaction of myself and the parties employing me. There are many important points which must not be overlooked in arranging plans for ventilation, for the adaptation of the means to the end varies with the place and locality—varies also with the character of the ventilation required. There are many details which need special attention, as, for example, the calibre of the ventilating pipes; the best position of the pipes in relation to the apartment to be ventilated; the proper adjustment of them in those cases in which from necessity they require to be partly horizontal; and the proper arrangement or adjustment also of their orifices, which is a matter of the very first importance.

It is not common for individuals, engaged in a specialty, to speak of failures in their business or profession, but I prefer to do so. Some years ago, the well known Mr. Ives, the proprietor of the Albemarle Hotel, in New York city, employed me to ventilate his larder or provision house for a stipulated sum. I made several failures in the attempt, known only to myself, and expended five times as much money as I was to receive for the work. Finally, however, I succeeded, to the entire satisfaction of Mr. Ives, and his card of commendation may be seen among my testimonials in another place. Since then he has employed me to ventilate other parts of his house. I make these statements for no other purpose than to show how much care and judgment are required to accomplish the work of ventilation successfully.

Leading Points of the Ventilator.—1. It is simple in its construction, and never gets out of repair. 2. It requires no skill in its use, and no one to be in attendance, excepting to light the gas in the lantern. 3. It costs but a trifle for the gas by which it is kept in operation, and is therefore extremely economical. 4. It can be readily introduced into any house, building, or enclosure which requires to be ventilated. 5. It will remove the foul air quickly, and as no other method of ventilation, ever yet discovered, is capable of doing. See address to "Architects and Builders," page 11.

Professor Draper's Mode of Ventilation.—Professor Draper, who is highly distinguished as an author and man of science, recently published a Text Book on Physiology, Hygiene, &c., from which we have taken a motto for our title page, and from which, also, we purpose to make brief extracts in relation to foul, damp air and ventilation. We do this chiefly to show that the mode of ventilation he has pointed out, as a sort of necessity, we presume, for family emergencies, is troublesome and incomplete compared with the plan to which we invite public attention.

"It is said," remarks Prof. Draper in his new book, "that in many of the houses in New York the servants first light the fires and pump the water out of the cellars; though this may be an exaggeration, we all know that a damp cellar is the rule, and a dry one the exception. * * * It is therefore very important that the cellar of every house, whether private or tenement, should be properly cleansed, dried, and ventilated during the years when the epidemic diseases are raging, if at no other time. * * * In the winter season the furnace will generally produce a sufficient ventilation of the cellar, and prevent the foul air entering the house; but in the spring and summer, when cholera commences to rage with the greatest violence, the furnace is then extinguished, and there is no ventilation of the cellar. At this time the danger which impends may to a great extent be avoided by placing a small stove in it, in which a fire should be kept burning continually," &c.

Without assuming to discuss this matter, it must be obvious that a fire cannot be kept *continually* burning in a stove without considerable expense, and a great deal of care and trouble in watching the fire. Besides, the fire is liable to go out, from the negligence of the servant, and thus the absence of ventilation for a time, and more than likely for a whole night, may be the critical moment when the cholera, or some other disease, will number us among its unwilling victims. By the use of our Ventilator, we have a perpetual motive power, which will cost but a trifle, and which will be a faithful guardian of our health, so far as ventilation is concerned, whether the servants be asleep or awake. Moreover, the Ventilator will not only furnish an abundant supply of dry air, in place of the foul, damp, and noxious air, so aptly described by Prof. Draper, but it will afford an agreeable light to one's cellar without any increase of the heat, which is not needed, to say the least, in summer.

Advantages of the Ventilator.—It removes foul air, unpleasant odors, and all noxious gases, as heretofore stated, and furnishes a constant supply of pure, sweet, dry air in their place, which should be a primary consideration with all who have a regard for their health, comfort, or lives.

It will furnish a bountiful supply of pure air to one's kitchen, so that one's food will be in a more wholesome condition for use, and if one's wife or daughter should go into the kitchen to superintend culinary, or other duties, she can return to the parlor without having the disgusting kitchen odor upon her dress or person. Bishop Hughes has said that every young woman, however wealthy or accomplished, should graduate in the kitchen, and there is no doubt that young ladies, anxious, as they should be, to become accomplished housewives, would be much more inclined to oversee the affairs of the kitchen, if, while there, they could have a sweet and wholesome atmosphere to breathe.

The Ventilator will remove the foul air from every part of your domicil, so that the odors and noxious gases from drains, water closets, kitchens, damp or wet cellars or basements, and other foul places, will be effectually carried away, along with the unwholesome effluvia from your bodies, and the carbonic acid gas thrown out from your lungs and generated by your gas burners, or petroleum lamps. Thus, you may sleep sweetly all night, in a pure, healthful air, which will greatly promote the health of your family, and especially that of your children, who are extremely sensitive to the influences of foul air. Rich furniture, gilded picture frames, and fresco paintings upon walls and ceilings, are frequently injured by foul, damp air, but may be effectually preserved by our mode of ventilation. This alone would more than pay for the cost of ventilation. It may be remembered that in 1863, we were visited by a peculiar atmosphere, which, through its dampness, or otherwise, had the effect to mould the paper upon the walls of our houses, and cause it to peel off; to mar the varnish of the furniture, to mould the carpets, and cause them to rot speedily; to mould even the pictures; and in some instances the canvass of the pictures was completely rotted, causing the entire loss of a large number of invaluable pictures. Many houses in New York city and Brooklyn had to be completely refitted in consequence of the injury sustained through the destructive influence of the atmosphere in question; and all of this loss and evil might have been counteracted by efficient ventilation,

which would have prevented the stagnature of the damp or unwholesome air within your apartments.

The Ventilator removes impure air from *horse stables*, the ammoniacal vapors of which tarnish or destroy the varnish upon carriages, and cause horses to sicken and die. In this respect, therefore, ventilation would be a wise economy.

The Ventilator will prevent the rusting of goods made of steel, or iron, stored in basements, or other damp places. Thousands of dollars might be saved annually to the merchant, dealing in goods of this description, by efficient ventilation.

The Ventilator will furnish to your refrigerators and provision closets a pure, sweet, dry air, so that your food will not be tainted by the noxious gases which would otherwise be constantly accumulating, and you will be enabled to keep fresh meat, perishable fruits, and other articles of food for several weeks during the hot weather of summer.

The *excessive heat* which is frequently present in churches, legislative halls, and other public places, is often quite as annoying as the foul air, and may be completely removed by my Ventilator. We have this excess of heat in churches in summer, when they are lighted with gas. Indeed, it would seem to be less difficult to heat a large hall than it is to get rid of the excess of heat after it is generated. A committee was appointed within the year by the two houses of Congress in reference to the ventilation of the House of Representatives and the Senate Chamber, and Mr. Meigs, who was called before the committee, said that there was no difficulty in warming those two chambers, but when the heat was found to be in excess, it was not easy to get rid of it and at the same time maintain a pleasant and agreeable temperature.

Question for Physicians.—Within the flue of the Ventilator, two feet or more above the lantern in which the jet of gas is undergoing combustion, we have a temperature varying from 212 to 300 degrees, according to the amount of gas consumed. With one foot of gas per hour, we have a temperature of 212 degrees, and with three feet of gas the temperature will be about 300 degrees. The noxious gases of an apartment undergoing ventilation, including the *malarious poisons*, if they should be present, all pass up this flue, and are exposed to the heat within the flue; and the question arises whether any advantage of a sanitary character could be gained by the decomposition of these poisons through the agency of the

heat. There would seem to be not merely *one* but a *number* of the malarious poisons, and if I am not misinformed, they are decomposed and destroyed at a temperature varying from 190 to 210 degrees. If this be true, it would be easy to effect their decomposition within the Ventilator. When the foul air, whatever may be its composition, passes upward from the Ventilator into the atmosphere, it may be entirely incapable of doing further injury; but still, this is a question which physicians can decide more easily than myself, and it would afford me great pleasure to hear any suggestions from them upon this subject, especially in reference to the epidemic influences now threatening the country. If the cholera, as some physicians have represented, is capable of being propagated through fecal discharges, and those discharges contain some specific malarious poison, it will be found of course in water closets, and in the ventilation of these closets, this terrible choleric poison may be destroyed by the heat of the Ventilator and rendered forever harmless. The only question to be determined, therefore, is, whether the noxious gases and malarious poisons, after they have passed from the Ventilator into the air, are likely to return and give us any further trouble. If yes, then the decomposition of the malarious poisons by the heat of the Ventilator would be a desideratum.

Our Patents.—These are three in number, one of them being for show window ventilation, dated May 26, 1863; another for ventilating and lighting large refrigerators, provision closets, bank vaults, and similar places, dated April 25, 1865; and the third for all the general purposes of ventilation, dated May 9, 1865, having a wood-cut illustration opposite to the title page.

# CERTIFICATES.

## HOTELS.

ALBEMARLE HOTEL, Cor. of 5th Ave. and 24th Street.

You ask me to say what I think about the Atmospheric Refrigerator. I have used both the Meat House and Chest for the last ten months. It works beautifully, and to my entire satisfaction. In fact, it comes fully up to your recommendation. I believe it is the only right principle for a Refrigerator.

GEORGE D. IVES, *Proprietor.*

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BREVOORT HOUSE, Jan. 19, 1864.

Dear Sir: I have had in use your system of ventilating Meat Chests and Ice Houses for eight or ten months, and am so much pleased with its operation that I take every opportunity to show and recommend it to my friends, as being the best thing I know of to preserve meats, with the least quantity of ice.

ALBERT CLARK, *Proprietor.*

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ST. NICHOLAS HOTEL, N. Y., Jan. 21st, 1864.

Dear Sir: We are well satisfied with our experience that your mode of ventilating Meat Houses is a decided improvement, and will commend itself for its good preserving qualities and saving of ice, to all who test it properly.

Yours truly, SPOTTS & HAWK.

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FIFTH AVE. HOTEL, New York, Feb. 2d, 1865.

Mr. H. A. GOUGE: Dear Sir—We take pleasure in assuring you that after a long and thorough trial of your Ventilating Apparatus, we are convinced that it is the very best of the kind extant. Very truly yours, HITCHCOCK, DARLING & CO.

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ST. JAMES HOTEL, New York, Jan. 19, 1864.

Dear Sir: Having thoroughly tested your patent "Ice House," constructed for this hotel, we cheerfully add our testimony to the many testimonials in its praise, as being, in our opinion, the most perfect and economical of those now in use. It not only preserves the meats, &c.. for an indefinite time, but it consumes very little ice. Wishing you every success, we remain,

Very respectfully, yours, T. F. WELLS & CO., *Proprietors.*

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Dear Sir: We take great pleasure in certifying that we have had in use for nearly a year one of your Ice Houses, erected by you, and which has given us entire satisfaction. We find it to keep Meats, Fish, &c., with the use of a small quantity of ice; and think it the most economical thing of the kind that can be used in a hotel. Yours, very truly, J. CURTIS & CO.

Brandreth House, New York, Jan. 20, 1864.

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MERCHANTS' HOTEL, 41 Cortlandt street, N. Y., May 8th, 1865.

Dear Sir: We have had in use the large Meat House you constructed for this Hotel now about one year; it has given us entire satisfaction. The ventilation seems to be perfect. Yours, &c., CLARKE & SCHENCK, Merchants' Hotel.

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WESTERN HOTEL, 9 Cortlandt street, N. Y., May 6th, 1865.

Dear Sir: The Atmospheric Meat House which you constructed for this Hotel, has now been in use for about one year, and has given entire satisfaction. I know of no other system of Ventilating which is effectual; your plan appears as perfect as it is simple. D. D. WINCHESTER, Western Hotel.

BELMONT HOTEL, 133 to 137 Fulton St., N. Y., May 9, 1865.

Mr. H. A. GOUGE: Dear Sir—The Ventilating Apparatus put up by you in my dining-room about four months ago, is a complete success. I am very much pleased with its operation. The room has been greatly improved by it. The principle is undoubtedly correct. Yours respectfully, J. P. RICHARDS.

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## PRIVATE FAMILIES.

This certifies that I have used your Atmospheric Refrigerator during the last nine months, and I can truly say that it surpasses all methods that have been in use for preserving in an edible condition whatever may be placed within it. In fact, I believe it comes fully up to the claims of the inventor.

SAM'L S. GUY, M. D., 181 Fort Greene Place.

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The Refrigerator you sent me last season has proved to be all you claim for it. I think it surpasses your modest recommendations as the correct method for preserving Meats and Fish (raw and cooked,) Fruit and Vegetables; and I have no doubt but you will find that this will soon supersede all other Refrigerators in use.

WILLIAM H. SMITH, 42 West Jersey Street, Elizabeth, N. J.

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I take pleasure in recommending your improved principle for Refrigerators, as the most scientific and perfect yet offered to the public. The one which you introduced into my house about a year ago, has never failed to accomplish all that you promised for it. Yours, JOHN D. ASCOUGH, 171 West 11th Street.

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We have used the Atmospheric Refrigerator in our family for the last year. I believe it to be the best Refrigerator in the world, and I can't conceive how it can be more perfect. We place all articles of food in it with Sweet Butter, &c., and we have none of the experience that I have had with other Refrigerators. You have conceived a plan that will surpass all others, without doubt.

Yours, JOSEPH SCOTT, *Silver Plater*,
No. 70 John St,, New York, and 24 Butler St., Brooklyn.

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## PROVISION HOUSES.

Mr. H. A. GOUGE: The Ventilating Apparatus you put up for me works to my entire satisfaction. I think I have given it as severe a test as it can possibly be put to. My cooling rooms (25 x 50) which were in my cellar and sub-cellar, were in a very bad condition—foul and damp—so much so it was very unhealthy for men, water constantly dropping from the ceiling. Since I have had your Apparatus there are no signs of dampness; the atmosphere is perfectly dry and pure; have not had a man complain of sickness. My pork cures as well in summer as in a winter atmosphere of 38 or 39 degrees. Your invention has been very valuable to me, and I cheerfully recommend it to Pork Packers, Butchers, &c., as the best thing I am acquainted with for the purpose.

HENRY SILVERHORN, *Pork Packer*, 92 Christie St., N. Y.

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NEW YORK, 152 West Street, Jan. 31st, 1864.

Mr. H. A. GOUGE: Dear Sir—Some few months ago we were at a loss to know what kind of an Ice House to put in our Packing House, which we were then fitting up, when you came to us and proposed to put up your Ventilating Chill Rooms, and not charge us a cent if they did not work well. We are happy to say that they did all you claimed for them, to our perfect satisfaction. A cold, dry, pure air, such as cannot be got in any other ice house. Yours truly,

D. & W. H. MILLEMANN, 152 West Street.

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BROOKLYN, Jan. 29, 1864.

Dear Sir: About one year ago, as an experiment, we had your Ventilating Apparatus applied to one of our Cooling Rooms, at our Packing House in Raymond Street. We are now satisfied with its utility enough to have it applied to all of our rooms. We believe it makes a perfect ventilation.

Very respectfully, JOSEPH LOCKITT & CO.

## BUTCHERS' MEAT HOUSES.

New York, Jan. 27, 1864.

Dear Sir: I have had in use the Atmospheric Meat House you built for me, now about one year, through an unusual hot summer, and ice of the poorest quality. I can say that it has given me entire satisfaction, and, as I tell my friends, I never paid for any thing that gave me so much real pleasure. I cheerfully recommend it to butchers and families as the best Refrigerator that I am acquainted with.

Yours, &c., DAN'L F. FERNALD,
Union Market, Tillary, cor. Fulton Sts., Brooklyn.

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The Meat House you built for me last June suits me in every particular. The ventilation is so perfect, the air within is always perfectly pure and dry, free from sweat or moisture of any kind. I can hang meat up in this house with the animal heat in it, and it will cure as perfectly as a winter atmosphere of 38 to 40 degrees. With my experience, I conceive it to be the most useful invention of the age for the purpose. I cheerfully recommend it to the trade generally.

Wishing you every success, yours respectfully,
CHARLES W. CONWAY, *Butcher*, 275 3d Avenue.

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This is to certify that I have used in my business the Atmospheric Meat House for the last nine months, and will say that it works to my entire satisfaction, both summer and winter. I have experimented with it, particularly as to its quality of preserving Fruit, and am satisfied for this purpose it can't be beat. I believe this Meat House is the best thing ever used for the purpose.

D. TILTON, *Dealer in Poultry and Game*,
No. 12 Franklin Market, & 74 & 76 Tompkins Market.

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444 6th Avenue, Jan. 23, 1864.

Dear Sir: I have great pleasure in bearing testimony to the very superior system adopted by you of ventilating Meat Chests and Ice Houses. I have now tried your plan some time, and it gives me great satisfaction in saying that it is far superior to any others, and I shall consider it to be my duty to recommend its adoption to my friends. I am, dear sir, yours respectfully,
JOSEPH COLWELL.

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May 6th, 1865.

Mr. H. A. Gouge: Dear Sir—The Ventilating Apparatus put up by you in my Shop about one year ago is a complete success; I have kept Meats in it during the summer months for four weeks without taint or change of color, and did not lose a pound of meat during the entire season. I would not do without it for ten times its cost. B. JOACHIM, 48 Greenwich St., N. Y.

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Nos. 29 and 30 Fulton Market, N. Y., May 10, 1865.

Mr. H. A. Gouge: Dear Sir—Please make for me another of your Ventilating Meat Houses, 6 by 10, 8 ft. high, in sections, so that it can be shipped in the hold of a vessel. I want it as soon as possible. Those which you made for me last season, and which were shipped to the West Indies, have given complete satisfaction. CHARLES COOPER.

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## MISCELLANEOUS.

Washington, December 20, 1865.

Mr. Gay: There has been in operation in the Post Office in this city one of Gouge's ventilators for the past two months. It was put in for the purpose of ventilating the basement in which are stored the mail bags and pouches, from which a supply for other offices is drawn.

Before the Ventilator was put up the air in the room was damp and impure, so much so as to be very disagreeable and unhealthy to persons remaining in it any length of time; and the leather pouches would be covered with mould and the sacks and bags with mildew The Ventilator has removed both the bad air

and the dampness, and a person can discover no difference in the air from that in the rooms above. The pouches and bags are now perfectly dry, and we think the Ventilator has already saved to the Department double its cost in preventing injury to them.

It was put up as an experiment, to be paid for if it succeeded. We would not have it removed for any consideration whatever I think it will be very generally adopted in this city. Truly yours, &c.,

S. J. BOWEN, *Postmaster.*

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*Office of the Tribune*, NEW YORK, February 9th, 1865.

Mr. H. A. GOUGE: Dear Sir—I cheerfully testify to the efficiency of the Ventilators put up by you in our Editorial Rooms. The principle is unquestionably correct. In the disconnected outer room, where ventilation was most needed, the success is perfect. Your ob't servant, S. H. GAY.

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NEW YORK, Feb. 7th, 1865.

Mr. H. A. GOUGE: Dear Sir—I have your Ventilating Apparatus in use at my house and stable. Its operation is perfectly satisfactory, and I am so much pleased with it that I cheerfully recommend it to the public. Yours, &c.,

PARAN STEVENS, 238 5th Avenue.

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Mr. H. A. GOUGE: It gives me great pleasure to furnish you with my opinion as to the merits of your "Ice Closet," based upon six months' experience of the one in use at the "Ladies' Kitchen," McDougall Hospital. It is certainly a most admirable invention, enabling us to keep in perfect preservation, during the unusual heat of the past summer, Milk, Poultry, Meats, Fruits, Vegetables, &c., with, as I have frequently heard the Steward remark, a very economical consumption of ice.

MRS. G. S. ROBBINS.

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NEW YORK, Feb. 4, 1864.

Dear Sir: The large cooling room you built for this place about a year ago, I am glad to say gives me great satisfaction. I believe it does all you promised. Your mode of lighting and ventilating these rooms is perfect.

Yours, &c., J. H. CROOK, 39 and 40 Park Row.

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I have had some experience with Refrigerators, and I have had entire control of the Meat House and Box you put up in this hotel last July, and I must say that it is the only Refrigerator that I ever saw that will keep Fish and Meat (cooked and raw) together, without one tasting of the other. I believe it to be the best Refrigerator in use. FRANCOIS LESOURD, *Chief Cook, Albemarle Hotel,*

Cor. 5th Ave. and 24th St., N. Y.

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*Chamberlain's Office, Broadway Bank*, NEW YORK, March 23d, 1866.

G. GAY, Esq.:—Dear Sir—I have now had "Gouge's Ventilator," which you recommended to me, in use in my stable for several months, and it gives me great pleasure to state, that in my judgment, it is decidedly the most perfect ventilator yet invented. Very resp'y yours,

DANL. DEVLIN.

# BUSINESS NOTICE.

## H. A. GOUGE,

THE MANUFACTURER AND PATENTEE OF

# "GOUGE'S ATMOSPHERIC VENTILATOR,"

Holds himself in readiness to make applications of the same for any of the purposes of Ventilation, whenever called upon by his patrons. His Apparatus is adapted to

Parlors; Dining and Sleeping Rooms; Kitchens and Basements; Cellars, Vaults and Water Closets; Tenement Houses; School, Lecture and Court Rooms; Churches; Legislative Halls; Poor Houses, Prisons and Hospitals; Factories and Dye Houses; Breweries and Distilleries; Powder Magazines; Stores and Show Windows; Banking Houses; Hotels and Restaurants; Fruit and Provision Closets; Pork Packing Houses; Meat Houses for Hotels, Butchers, &c.; Stables; Ships and Steamboats; &c., &c.

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**OFFICE 254 BROADWAY,**

NEW YORK CITY.